GROUP ART UNIT: 1713
APPEAL NO. _____

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF APPEALS AND INTERFERENCES

APPELLANT'S BRIEF

Eric Gustave Lundquist

Application for Patent Filed March 22, 2004

Serial No. 10/805,792

HIGH PRODUCTIVITY BISPHENOL-A-CATALYST

Andrew E. C. Merriam
Attorney for Appellant

Ives J. Wu
Examiner

Enclosed:
Brief
Certificate of Mailing
Fee Transmittal
Petition for Revival
Notice of Appeal

RECEIVED
CENTRAL FAX CENTER

FEB 1 5 2007

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:	Eric Gustave Lundquist			
Application No.:	10/805,792	**Group No.**	:	1713
Filed:	21-Aug-2002	**Examiner**	:	W. Cheung

For: HIGH PRODUCTIVITY BISPHENOL-A-CATALYST

Honorable Commissioner of Patents and Trademarks
Alexandria, VA 22313-1450

BRIEF FOR APPELLANT

This is an appeal from the final rejection by the Examiner dated June 16, 2006 rejecting claims 1-4 and 21-33. The Notice of Appeal pursuant to 37 C.F.R. § 41.31 is enclosed herewith.

An authorization to charge payment of the fee for the filing of the Appeal Brief to Deposit Account 18-1850 is also enclosed.

REAL PARTY IN INTEREST [37 C.F.R. § 41.37(c)(1)(i)]

The real party in interest is the Rohm and Haas Company, the assignee of the patent application by virtue of the named inventor's employment agreement and subsequently executed assignment document.

RELATED APPEALS AND INTERFERENCES [37 C.F.R. § 41.37(c)(1)(ii)]

There are no related appeals or interferences to this patent application.

STATUS OF CLAIMS [37 C.F.R. § 41.37(c)(1)(iii)]

The status of the claims is as follows:

Allowed claim	-	none
Claims objected to	-	none
Claims canceled	-	5-20 and 34-36
Claims pending	-	1-4 and 21-33
Claims rejected	-	1-4 and 21-33
Claims on appeal	-	1-4 and 21-33

STATUS OF AMENDMENTS [37 C.F.R. § 41.37(c)(1)(iv)]

There are no pending amendments in this case.

SUMMARY OF CLAIMED SUBJECT MATTER [37 C.F.R. § 41.37(c)(1)(v)]

Appellant's invention is directed to a catalyst composition for significantly increasing the productivity of fixed-bed reactors in the production of bisphenol-A. Claim 1 is directed to a catalyst comprising at least one sulfone cross-linked ion exchange resin having improved resistance to deformation under pressure, the catalyst further comprising polymerized monomer units of (a) from 0.1 to 10 percent by weight of one or more polyvinylaromatic monomers and (b) from 90 to 99.9 percent by weight of one or more monounsaturated vinylaromatic monomers; wherein the catalyst contains 0.1 to 1.0 millimole sulfone groups per gram dry catalyst. Claim 26 is directed to a catalyst comprising at least one sulfone cross-linked ion exchange resin having improved resistance to deformation under pressure, the catalyst further comprising a copolymer having between 1.0 and 6.0% by weight of divinylbenzene cross-linking, wherein the catalyst is sulfonated to a dry weight acid capacity of greater than 4.0 mmol/g and

having between 0.1 to 1.0 mmol/g of sulfone bridging groups per gram dry catalyst.

Furthermore the catalyst is a high productivity catalyst for bisphenol-A which comprising strongly acidic cation-exchange resin spheres produced from a polystyrene/divinylbenzene (PS/DVB) copolymer sulfonated under conditions to introduce sulfone cross-linking also called sulfone bridging. Surprisingly, the sulfone cross-linking or bridging improves the resistance to deformation but does not have a negative effect on the activity and selectivity of the catalyst in bisphenol-A production. The catalysts used in the process of the present invention provide an unexpected combination of desired performance properties in the synthesis of bisphenol A: reactivity, selectivity, compressibility and hydraulic.

The bisphenol-A catalyst of the present invention is characterized in that the spherical catalyst particles substantially resist deformation under pressure as compared to currently known bisphenol-A catalysts and possess higher reactivity as compared to currently known bisphenol-A catalysts.

Specification page 3, line 20 to page 4, line 2.

GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL [37 C.F.R. § 41.37(c)(1)(vi)]

The issue is whether appellant's invention as defined in claims 1-4 and 21-33 are anticipated under 35 U.S.C. § 102(b) or in the alternative obvious under 35 U.S.C. § 103(a).

Claims 1-4 and 21-33 stand finally rejected as anticipated under 35 U.S.C. § 102(b) or in the alternative obvious under 35 U.S.C. § 103(a) by Appellant's own *Lundquist* (US 5,233,096A). The Examiner's position is that Appellant's claims are anticipated and obvious because "the disclosure of *Lundquist* meets the catalyst composition as claimed by the applicant, it would inherently possess the physical

properties of 0.1 to 1.0 millimole sulfone groups per gram dry catalyst." (Rejection dated 6/16/06, page 3).

ARGUMENT [37 C.F.R. § 1.192(c)(1)(vii)]

Claims 28-30

The argument presented by the Examiner that the catalyst composition disclosed in *Lundquist* is identical to that of the Apellant is incorrect because *Lundquist* does not disclose, teach or suggest a catalyst comprising sulfone bridging groups. In the present invention, Appellant discloses a catalyst for bisphenol-A which comprising strongly acidic cation-exchange resin spheres produced from a polystyrene/divinylbenzene (PS/DVB) copolymer sulfonated under conditions to introduce sulfone cross-linking also called sulfone bridging. One skilled in the art would not look to *Lundquist* for teaching of sulfone bridging.

35 U.S.C. § 102(b) – Anticipation and 35 U.S.C. § 103(a) - Obviousness

Anticipation requires the presence in a single prior art reference disclosure of each and every element of the claimed invention, *arranged as in the claim. Lindemann Maschinenfabrik GmbH v. American Hoist & Derrick Co.*, 221 USPQ 481, 485 (Fed. Cir. 1984) (emphasis added). There must be no difference between the claimed invention and the reference disclosure, as viewed by a person of ordinary skill in the field of the invention. *Scripps Clinic & Research Foundation v. Genentech Inc.*, 18 USPQ 2d 1001, 1010 (Fed. Cir. 1991). As discussed above, Lundquist fails to disclose the catalyst of the present invention.

Determination of obviousness cannot be based on the hindsight combination of components selectively culled from the prior art to fit the parameters of the patented invention. There must be a teaching or suggestion within the prior art, or within the general knowledge of a person of ordinary skill in the field of the invention, to look to particular sources of information, to select particular elements, and to combine them in

the way they were combined by the inventor. *ATD Corporation v. Lydall, Inc.*, 48 USPQ 2d 1321, 1329 (Fed. Cir. 1998). In ascertaining the differences between the prior art and the claims at issue it is essential to view the claims at issue as "the invention as a whole." In so doing, it is legally improper to focus on the obviousness of substitutions and differences between the claimed invention and the prior art rather than on the obviousness of the claimed invention *as a whole* relative to that prior art. *Hybritech, Inc. v. Monoclonal Antibodies, Inc.*, 802 F.2d 1367, 1383, 231 USPQ 81, 93 (Fed. Cir. 1986), cert. Den., 480 US 947 (1987).

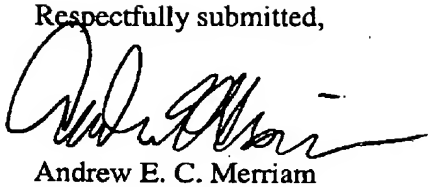
Appellant asserts that the catalyst composition claimed in *Lundquist* does not and can not inherently contain sulfone bridges, also known as sulfone groups, as sulfone bridges cannot be obtained using the sulfonation conditions described in *Lundquist*. *Lundquist* discloses in example 3 the use of 96.6% H_2SO_4. The use of this concentration of sulfuric acid (96%) is also described in Comparative Example 4, Catalyst A of the present specification and is described as a catalyst that contains 0 mmol of sulfone bridges.

In order to produce sulfone bridges or sulfone groups as is required by the claims of the present invention, greater than 101 % sulfuric acid is required. As described in the present specification on page 9, greater than 100% sulfuric acid contains free sulfur trioxide. This sulfur trioxide is responsible for the formation of the sulfone bridges. Thus the composition of the catalyst described in *Lundquist* since it is not sulfonated with oleum could not contain sulfone bridging groups and thus could not inherently possess the physical properties of 0.1 to 1.0 millimole sulfone groups per gram dry catalyst.

Accordingly, *Lundquist* fails to disclose all of the limitations of Claims 1-4 and 21-33 and reconsideration and withdrawal of this rejection are respectfully requested.

For the foregoing reasons, Appellant respectfully requests the Board to reverse the Examiner's rejection under 35 U.S.C. § 102(b) and 35 U.S.C. § 103(a) as anticipated by and obvious by Lundquist and to remand the application for further review. The Commissioner is hereby authorized to charge the appeal filing fee, and any additional fee that may be required, or to credit any overpayments to Deposit Account 18-1850.

Respectfully submitted,



Andrew E. C. Merriam
Attorney for Appellant
Registration No. 47,268

TMC/ld (DN A01041A)
ROHM AND HAAS COMPANY
100 Independence Mall West
Philadelphia, PA 19106-2399
Telephone : (215) 592-3410
Facsimile : (215) 592-2682

RECEIVED
CENTRAL FAX CENTER

FEB 1 5 2007

CLAIMS APPENDIX

IN THE CLAIMS:

1. A catalyst comprising at least one sulfone cross-linked ion exchange resin having improved resistance to deformation under pressure, the catalyst further comprising polymerized monomer units of (a) from 0.1 to 10 percent by weight of one or more polyvinylaromatic monomers and (b) from 90 to 99.9 percent by weight of one or more monounsaturated vinylaromatic monomers; wherein the catalyst contains 0.1 to 1.0 millimole sulfone groups per gram dry catalyst.

2. The catalyst of claim 1, wherein the catalyst is in the form of spherical beads, has an acid capacity of 4.0 to 6.0 millimole sulfonic acid groups per gram dry catalyst and is capable of catalyzing the formation of at least one bisphenol upon contacting phenols and aldehydes or ketones.

3. The catalyst of claim 2, wherein the catalyst resin beads are prepared from a jetted, suspension polymerized polystyrene/divinylbenzene copolymer.

4. The catalyst of claim 1, wherein the catalyst is present in a reactor used for producing at least one bisphenol and is present in an amount from about 1 % to 40 % by weight, based on total weight of reactants, which comprises one or more phenols and one or more aldehydes or one or more ketones.

CLAIMS 5-20 (Canceled).

21. The catalyst of claim 1, wherein the catalyst further comprises 1 % to 35 % by weight of sulfonic acid groups containing anionically attached thiol promoter.

22. The catalyst of claim 1, wherein the catalyst catalyzes the condensation reaction between phenol and acetone, yielding bisphenol-A.

23. The catalyst of claim 1, wherein the one or more polyvinylaromatic monomers is selected from the group consisting of: divinyl benzene, divinyl toluene, trivinyl benzene, divinyl chloro benzene, diallyl phthalate, divinyl naphthalene, divinyl xylene, divinyl ethyl benzene, trivinyl naphthalene, polyvinyl anthracenes, aliphatic cross-linking monomers, aliphatic divinylacrylates, aliphatic polyvinylacrylates, aliphatic polyvinyl methacrylates, trimethylolpropane trimethacrylate, ethylene glycol dimethacrylate, ethylene glycol diacrylate, neopentyl glycol dimethacrylate, pentaerythritol tetramethacrylates, pentaerythritol trimethacrylates, trivinyl cyclohexane and combinations thereof.

24. The catalyst of claim 1, wherein the catalyst comprises 0.6 mmol of aromatic rings having two sulfonic acid groups per gram of dry catalyst and the catalyst comprises 0.2 mmol of sulfone bridging groups per gram of dry catalyst.

25. The catalyst of claim 1, wherein the one or more monounsaturated vinylaromatic monomers are selected from the group consisting of styrene, substituted styrenes, α-methyl styrene, vinyltoluene, ethyl vinyl benzene, vinyl naphthalene and combinations thereof.

26. A catalyst comprising at least one sulfone cross-linked ion exchange resin having improved resistance to deformation under pressure, the catalyst further comprising a copolymer having between 1.0 and 6.0% by weight of divinylbenzene cross-linking, wherein the catalyst is sulfonated to a dry weight acid capacity of greater than 4.0 mmol/g and having between 0.1 to 1.0 mmol/g of sulfone bridging groups per gram dry catalyst.

27. The catalyst of claim 26, wherein the catalyst comprises between 1 and 4% by weight of divinylbenzene crosslinking, wherein the catalyst is sulfonated to a dry weight acid capacity of greater than 5.1 mmol/g.

28. The catalyst of claim 26, wherein the catalyst resin is in the form of spherical beads that are prepared from a jetted, suspension polymerized polystyrene/divinylbenzene copolymer.

29. The catalyst of claim 26, wherein the catalyst is present in a reactor used for producing at least one bisphenol and is present in an amount from about 1 % to 40 %

by weight, based on total weight of reactants, which comprises one or more phenols and one or more aldehydes or ketones with a sulfonated, cross-linked ion exchange resin functionalized with strongly acid cation-exchange groups.

30. The catalyst of claim 26, wherein the catalyst further comprises 1 % to 35 % by weight of sulfonic acid groups containing an ionically attached thiol promoter.

31. The catalyst of claim 26, wherein the catalyst catalyzes the condensation reaction between phenol and acetone, yielding bisphenol-A.

32. The catalyst of claim 26, wherein the one or more polyvinylaromatic monomers is selected from the group consisting of: divinyl benzene, divinyl toluene, trivinyl benzene, divinyl chloro benzene, diallyl phthalate, divinyl naphthalene, divinyl xylene, divinyl ethyl benzene, trivinyl naphthalene, polyvinyl anthracenes, aliphatic cross-linking monomers, aliphatic divinylacrylates, aliphatic polyvinylacrylates, aliphatic polyvinyl methacrylates, trimethylolpropane trimethacrylate, ethylene glycol dimethacrylate, ethylene glycol diacrylate, neopentyl glycol dimethacrylate, pentaerythritol tetramethacrylates, pentaerythritol trimethacrylates, trivinyl cyclohexane and combinations thereof.

33. The catalyst of claim 26, wherein the catalyst comprises 0.6 mmol of aromatic rings having two sulfonic acid groups per gram of dry catalyst and the catalyst comprises 0.2 mmol of sulfone bridging groups per gram of dry catalyst.

CLAIMS 34-36 (Canceled).

EVIDENCE APPENDIX

None

RELATED PROCEEDINGS APPENDIX

None